

Math 101: Calculus I

Jacob Russell

Fall 2020

Contact information

Instructor: Jacob Russell

Class Meetings: MWF 1:30 - 2:25

Office: Herman Brown Hall 454 (I will not often be physically on campus this semester)

Email: jacob.russell@rice.edu

Office Hours: (Tentative, will likely change) Tuesday 6:00pm - 7:00pm and Friday 11:00am–12:00pm.

* All times in the syllabus are in Houston time (CDT) *

Course objectives and learning outcomes

This course gives an introduction to the two fundamental mathematical problems of calculus: how to find the area under the graph of a function and how to find the equation of the tangent line to a function. In both cases, we will see how limits—the central object in calculus—allows us to solve both problems via increasingly accurate approximations. We will also see how these abstract mathematical ideas are inspired by and find application in a variety of scientific settings. As important as the specific content, an emphasis will be placed on developing strong mathematical thinking, problem solving, and communication skills. My hope for the course is that students develop a rich understanding of the fundamental and beautiful ideas that make calculus a pervasive and powerful mathematical discipline.

Syllabus change policy

This syllabus is only a guide for the course and is subject to change with advanced notice. This is especially true as we navigate learning remotely this semester. I will endeavor to ensure that all changes are clearly and thoroughly communicated.

Summary of course operations

Here is a brief outline of how the course will be run. Each aspect of the course is described in more detail below.

Before each class meeting, students are be required to asynchronously complete an online learning sequence in preparation for the in-class activities. During class meetings, student will be divided into small groups to work collaboratively on activities based on the learning sequences. Class meetings will occur synchronously via Zoom in Canvas. Homework will be assigned weekly with each assignment containing both an online and written component. Written homework assignments will be turned in an graded online via Gradescope. The course will feature two midterms and a final exam that will be given synchronously in two different time slots.

In line with university policy, students who are ± 4 hours from Houston's time zone are required to attend the class meetings on Zoom. Students with more than a 4 hour time difference from Houston will be allowed to complete the in-class assignments asynchronously, however **student are strongly encouraged to enroll in a section of Math 101 where they will be able to participate synchronously**. The other section of Math 101 being taught this semester are at the following times on MWF:

8:30 am - 9:25 am, 11:00 am - 11:55 am, and 9:45 am - 10:40 am.

All sections of Math 101 will feature the same asynchronous learning sequences plus synchronous class room activities format. If you need help switching into a different section of Math 101, please do not hesitate to reach out to me.

Technology requirements

Here are what I consider the minimum technology you will need to fully access our online course.

- A computer or tablet for completing the learning sequences and in-class activities. A smart phone is most likely **not** sufficient for these purposes.
- A way of speaking, watching, and listening via Zoom. Ideally you also have a camera to display your video.
- A way of scanning or taking pictures of your homework to upload to Gradescope. A smart phone camera is likely sufficient.
- An internet connection. Ideally one that supports video streaming.

If you have the above, then you should be set-up for each aspect of our online course. You might find the following additional pieces of tech helpful, but (and I want to stress this) they are by no means necessary to fully engage with the course.

- The ability to view two (large) screens during class. For example, a computer with two monitors or a computer plus a tablet.

- A digital writing device such as a tablet with a pen or a writing pad for your computer (for example, this device: <https://rb.gy/wnigjx>).

If you have any questions or concerns about the technology you have or need, please don't hesitate to contact me.

You do not need a calculator of any kind for the course. In fact, the use of a calculator for an purpose beside basic arithmetic (addition, subtraction, multiplication, division, and exponentiation) is prohibited.

There is no text book for this course. If you want a book for reference purposes, you may use OpenStax Calculus Volume 1, which is available freely online. This course will cover basically all of that book through Section 6.3.

Online learning platforms

Here is a list of the online learning platforms we will use and their functions.

- Canvas: Posting zoom links for class meetings and office hours. Posting of class announcements and handouts.
- EdX: Contains learning sequences and online homework. Students will receive an email invitation to register. **Make sure your username is in the format [your preferred]_[your last name]**. For example, my user name is Jacob_Russell. If you did not get an invitation after the first day of class, email me immediately. The EdX page also contains a discussion forum for asking questions.
- Gradescope: Written homework and exams will be scanned and submitted via Gradescope. Exams and homework will be graded and returned via Gradescope. See the "Using Gradescope" file on Canvas.

Learning sequences

Before each class meeting, students are expected to complete a learning sequence on EdX. Learning sequences are due at 12:45pm each class day. Late submissions will not be accepted, but a student's two lowest-scoring sequences will be dropped.

Homework

Homework will be due each week at 11:59pm on Tuesday (starting Tuesday September 1st). Each assignment will have two parts. Part 1 is online at EdX. Part 2 is written and will need to be scanned and submitted via Gradescope. Barring a major emergency, no late homework will be accepted. However, a student's two lowest-scoring homework will be dropped.

Exams

Both midterms and final exams will be given synchronously online and will be turned in via Gradescope. Each exam will have two time slots. The date and times for the midterms are

- Midterm 1: Tuesday September 29th at 6:00 am and 7:30 pm
- Midterm 2: Tuesday October 27th at 6:00 am and 7:30 pm.

In the third week of class, you will be asked to commit to a time slot for both midterm exams.

The date for the final exam is determined by the Registrar's office and is not available until later in the semester.

Grading

Your course grade is calculated as 65% exams, 15% homework, 10% on learning sequences, and 10% participation in class activities and the online discussion board.

Your exam grade will be distributed among Midterm 1/Midterm 2/Final as 20/20/25, 20/15/30, or 15/20/30, whichever benefits you the most. When computing final course grades, a student's exam scores are normalized against scores of all students in Math 101 this semester, not just those in this section.

Learning sequences will be graded out of 95% of the total points, i.e., if you get 95% of the total points on the learning sequences then you will get full credit for the learning sequences.

Synchronous attendance

Students who are ± 4 hours from Houston's time zone are required to attend the class meetings on Zoom. Students with more than a 4 hour time difference from Houston will be allowed to complete the in-class assignments asynchronously. However, **student are strongly encouraged to enroll in a section of Math 101 where they will be able to participate synchronously**. Any student who is concerned about their ability to attend class meetings in real time should contact me immediately.

Zoom etiquette

It is important to me that I get to know each student in my class as quickly as possible. To help me with this, I request that everyone either has their video on during class meetings OR sets their profile picture to a clear photo of their face. This will assist me in learning to recognize everyone quickly. Here are instructions for adding a profile picture to your zoom account:

guidingtech.com/show-profile-picture-instead-video-zoom-meeting/

Most of the class time will be spent in small group. During this time your microphone can be on or off as needed (it should be on most of the time to facilitate a lively discussion). When we come together as the whole class, everyone should mute their microphones while they are not speaking.

Students will have full access to screen sharing and whiteboards features during class. I trust all students to use these features only for collaborating on class work.

Office hours

Office hours will be held virtually via Zoom. A link for each office hour will be posted on Canvas. When you join the office hour, you will be put into a waiting room. Please wait (virtually) until I let you into the Zoom room. If you cannot make my scheduled office hours, please email me to set up an alternative time. Students are also encouraged to use the EdX discussion forums to ask questions about the learning sequences or homework. I will review these forums before class each class day.

EdX Forum

The class EdX page contains a forum. Each learning sequence and homework assignment will have a corresponding thread in the forum. At the end of each learning sequence, you will be prompted to leave question or comment in the forum for that learning sequence. You don't need to do this every time, but to receive full credit in the "class participation" category, you must post in the forums at least once a week. Posts can be either your own questions or comments or responses to another student.

Rice honor code

In this course, all students will be held to the standards of the Rice Honor Code, a code that you pledged to honor when you matriculated at this institution. If you are unfamiliar with the details of this code and how it is administered, you should consult the Honor System Handbook at <http://honor.rice.edu/honor-system-handbook/>. This handbook outlines the University's expectations for the integrity of your academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process.

Collaboration policies

- Learning sequences: You should work alone. Outside assistance should be limited to asking questions about parts of videos that you did not understand.
- Homework: Collaboration and discussion with other is encouraged, but only after you have given problems a good amount of independent thought. In particular, while I encourage

student seek help with homework in office hours, you are expected to have worked on the problems before coming to me.

If you have worked with others on the online homework, you have a responsibility to make sure that you can reproduce all of the necessary work on your own before you submit the answer.

On written homework, please note the names of any collaborators on each problem. Furthermore, the final write-up of the problems should be done by yourself. You should show the steps you took in order to arrive at your answer, and you should understand what you are writing well enough that you need not refer to any writing or notes produced during your collaboration. It could be helpful to keep your collaborative and solo work very separate. For example, you could use colored paper when working with others, and white paper when working alone.

Student should maintain vigilant public health practices while collaborating on homework, including the wearing of masks and maintaining sufficient physical distance.

A calculator can be occasionally used for basic arithmetic (addition, subtraction, multiplication, division, and exponentiation **only**), but no other calculator functions (graphing, solving equations, etc) can be used. Note, no calculator of any kind is allowed on exams. No software can be used unless otherwise specified. Do not seek homework help from websites other than the course discussion forum (but please **do** use the discussion forum).

- Exams: Absolutely no external assistance or collaboration of any kind is permitted on exams. This includes (but is not limited to) calculators of any kind, referring to notes or class materials, or assistance from another person or website.
- In-class activities: Students will complete the in-class activities collaboratively unless otherwise stated. Students are encouraged to reference class material during the activities and ask questions of me and the teaching assistants. Students should not use resources (software, websites, people, etc) from outside of class during the activities.

Disability Resource Center

If you have a documented disability or other condition that may require specific accommodations you should:

1. make sure this documentation is on file with the Disability Resource Center (Allen Center, Room 111 / adarice@rice.edu / x5841) to determine the accommodations you need;
2. send me an email by the third week of the semester to discuss your accommodation needs.

Statement on diversity and inclusion

The Department of Mathematics supports an inclusive learning environment where diversity and individual differences are understood, respected, and recognized as a source of strength. Racism,

discrimination, harassment, and bullying will not be tolerated. We expect all participants in mathematics courses (students and faculty alike) to treat each other with courtesy and respect, and to adhere to the mathematics department standards of collegiality, respect, and sensitivity (see mathweb.rice.edu/departement-statement-collegiality-respect-and-sensitivity) as well as the Rice Student Code of Conduct. If you think you have experienced or witnessed unprofessional or antagonistic behavior, then the matter should be brought to the attention of the instructor and/or department chair. The Ombudsperson is also available as an intermediate, informal option, and contacting them will not necessarily trigger a formal inquiry.

The mathematics department chair is Professor Alan Reid. His email is mathchair@rice.edu. The Weiss School's Ombudsperson for students is Assistant Dean Lauren Kapcha whose email is lauren.kapcha@rice.edu.

The success of the class depends upon the classroom being a welcoming, supportive, and stimulating environment. I believe mathematics is something everyone can and should participate in. I will do everything I can to ensure that everyone feels comfortable not just being in class, but also participating in the discussion.

Title IX Responsible Employee Notification

Rice University cares about your wellbeing and safety. Rice encourages any student who has experienced an incident of harassment, pregnancy discrimination or gender discrimination or relationship, sexual, or other forms interpersonal violence to seek support through The SAFE Office (safe.rice.edu). Students should be aware when seeking support on campus that most employees, including myself, are required by Title IX to disclose all incidents of non-consensual interpersonal behaviors to Title IX professionals on campus who can act to support that student and meet their needs. For more information, please visit safe.rice.edu or email titleixsupport@rice.edu.